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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/731,007

12/10/2003

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04/04/2005

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EXAMINER

SUMMONS, BARBARA

ART UNIT

PAPER NUMBER

2817

DATE MAILED: 04/04/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/731,007

Applicant(s)

OSHIO, MASAHIRO

Examiner

Barbara Summons

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-10 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 4-6, 9 and 10 is/are allowed.
- 6) ☒ Claim(s) 1-3 and 8 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 10 December 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 5/4/04 & 12/10/03.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_.

## DETAILED ACTION

### *Information Disclosure Statement*

1. It should be noted that the Examiner acknowledges the receipt of an enhanced translation of JP 2003-69380 with the supplemental information disclosure statement received 5/4/04. The enhanced translation has been considered, even though the reference has been lined through so as not to print twice on the face of any U.S. Patent resulting from the instant application.

### *Claim Objections*

2. Claims 1, 2, 4, 5 and 6 are objected to because of the following informalities:

In claim 1, on line 7 thereof, for clarity only the Examiner suggests that "using a surface" be changed to - - using a rear surface - - as supported by the specification at, for example, page 14, line 4 and the abstract, lines 7-8 (see also Figs. 7 and 8).

Similarly, in claim 2, on line 2 thereof, the Examiner suggests changing "etching the surface" to - - etching the rear surface - -.

Also, in claim 4, on line 8 thereof, the Examiner suggests "etching the surface" be changed to - - etching the rear surface - -.

In claim 5, on line 8 thereof, the Examiner suggests "etching the surface" be changed to - - etching the rear surface - -.

Finally, in claim 6, on line 11 thereof, the Examiner suggests "etching a surface" be changed to - - etching a rear surface - -.

Appropriate correction is required.

***Claim Rejections - 35 USC § 102***

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. § 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

4. Claims 1-3 and 8 are rejected under 35 U.S.C. § 102(a) as being anticipated by JP 2003-69380 (JP '380)[cited by Applicant].

Regarding claim 1, JP '380 discloses a method of controlling the frequency temperature characteristics of a surface acoustic wave (SAW) device (see the abstract, "solution") by thinning the quartz crystal substrate, which inherently is also a method of controlling the frequency as disclosed by JP '380 at, for example, section [0051], line 1 and section [0012], line 1, because changing the thickness of the quartz crystal substrate will inherently change the frequency of the device. The method comprises: a quartz crystal ST cut substrate 1 (see e.g. Fig. 1, the abstract and section [0043]); interdigital transducer electrodes 2 formed on the substrate 1, the IDT electrode exciting quasi-longitudinal leaky surface acoustic waves (see e.g. the abstract and the last line of section [0011]); and wherein the frequency is controlled by controlling a thickness  $t$  of the quartz substrate 1 using a rear surface BS of the quartz substrate 1 that faces the surface where the IDT electrodes 2 are formed (see sections [0021] and [0023]).

Regarding claim 2, the rear surface BS of the substrate 1 is dry etched using a fluorine gas (see section [0039]). Regarding claim 3, the substrate is also preliminarily

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etched on the top surface where the IDT electrodes are formed (see e.g. section [0012], lines 4-5). Regarding claim 8, see the Title of the Invention and section [0007].

### ***Allowable Subject Matter***

5. Claims 4-7, 9 and 10 are allowable over the prior art of record.

6. The following is a statement of reasons for the indication of allowable subject matter:

The prior art of record does not disclose or fairly suggest, a method of controlling the frequency of a SAW device comprising each of the specifically recited features i.e. steps and especially "etching... until a desired frequency is obtained while measuring an input-output characteristic of the surface acoustic wave device" (see the last three lines of claims 4-6. The JP '380 reference only monitors the thickness of the substrate by means of measurement section 45 in Fig. 7 (see also section [0038]), and etches until a desired thickness is obtained, not a desired frequency.

### ***Conclusion***

7. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

The articles "Production Trimming of SAW Devices Using CF<sub>4</sub> Chemistry and its Effects on SAW Characteristics" to Subramanian et al. and "SAW Resonators Frequency Trimming By Plasma Etching" to Weiss et al., and Yatsuda U.S. 6,321,444

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each disclose only etching the IDT electrodes or the face of the substrate on which the IDT electrodes are formed. Additionally, Yatsuda shows a package with a window through which a flip chip mounted SAW device is etched.

Matsuta U.S. 6,781,484 (Fig. 3) and Kikushima U.S. 6,762,537 [Figs. 1(b), 9 and 16(b)] each show SAW devices mounted in packages with an Integrated Circuit (IC) chip.

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Barbara Summons whose telephone number is (571) 272-1771. The examiner can normally be reached on M-Th, M-Fr.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Bob Pascal can be reached on (571) 271-1769. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

bs  
March 29, 2005



**BARBARA SUMMONS**  
**PRIMARY EXAMINER**